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Applicant	: Tucker et al.	Art Unit	: 2164
Serial No.	: 10/812,901	Examiner	: Jacob F. Betit
Filed	: March 31, 2004	Conf. No.	: 4995
Title	: METHODS AND SYSTEMS FOR EFFICIENT QUERY REWRITING		

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Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Previously Presented) A method comprising:

populating a memory, wherein populating the memory comprises:

receiving a first search query having first content, the first content comprising a plurality of search terms forming a phrase;

rewriting the first search query, based on the phrase, into a modified search query;  
and

mapping the first search query to the modified search query in the memory; and

subsequently processing a second search query including:

receiving the second search query having second content;

determining whether at least one portion of the second content matches the first content; and

responsive to the at least one portion of the second content matching the first content, executing a search that includes the modified search query in place of the at least one portion of second search query and returning one or more corresponding search results as responsive to the received second search query.

2. (Canceled)

3. (Previously Presented) The method of claim 1, further comprising:  
responsive to the second content not comprising any portion that matches the first content, executing a search of the received second search query.
4. (Previously Presented) The method of claim 1, wherein the memory comprises a look-up table for the mapping.
5. (Previously Presented) The method of claim 1, wherein the search of the modified second search query is executed by a backend data system.
6. (Previously Presented) The method of claim 5, wherein the backend data system is physically apart from the memory and comprises one or more databases having data to be searched.
7. (Previously Presented) The method of claim 5, wherein the memory comprises a look-up table mapping the first search query to the modified search query; and  
wherein the backend data system is physically apart from the memory and comprises one or more databases having data to be searched.
8. (Previously Presented) The method of claim 1, wherein the step of mapping is performed offline prior to the step of receiving the second search query; and the step of executing the search is performed online upon receiving the second search query.

9. (Original) The method of claim 1, wherein the step of rewriting the first search query into the modified search query comprises:

- determining that the first search query is frequently received;
- issuing the first search query to the backend data system to find information related to the first search query;
- determining additional content for the first search query based on the related information;
- and
- rewriting the first search query into a modified search query having the first content and the additional content.

10. (Original) The method of claim 1, wherein the step of rewriting the first search query into the modified search query comprises:

- determining a more common or popular phrase or term for the first content of the first search query; and
- rewriting the first search query into the modified search query having the more common or popular phrase or term in place of the first content.

11. (Original) The method of claim 1, wherein the first and second search queries are received at a first system of a search site, and the search of the modified search query is issued by a search engine in the first system.

12. (Previously Presented) The method of claim 11, wherein the first system of the search site comprises cache memory.

13. (Previously Presented) The method of claim 11, wherein the memory is physically apart from the first system of the search site.

14. (Original) The method of claim 11, wherein the step of rewriting is performed by the first system of the search site.

15. (Original) The method of claim 14, wherein the steps of mapping and determining are performed by the first system of the search site.

16. (Previously Presented) The method of claim 14, wherein the memory is a database in a memory system of the search site, and the steps of mapping and determining are performed by the memory system.

17. (Previously Presented) The method of claim 11, wherein the memory is a database in a memory system of the search site, and the step of rewriting is performed with the memory system.

18. (Previously Presented) The method of claim 17, wherein the steps of mapping and determining are performed by the memory system.

19. (Original) The method of claim 17, wherein the steps of mapping and determining are performed by the first system of the search site.

20. (Previously Presented) The method of claim 1, wherein the memory comprises a memory chip.

21. (Previously Presented) The method of claim 1, wherein the memory comprises a disk-storage memory device.

22. (Original) The method of claim 1, wherein the step of rewriting the first search query into the modified search query comprises:

determining an additional phrase or term for the first content of the first search query; and  
augmenting the first search query with the additional phrase or term.

23. (Previously Presented) A computer-readable storage device having computer-executable instructions contained therein for performing a method, the method comprising:

populating a memory, wherein populating the memory comprises:

receiving a first search query having first content, the first content comprising a plurality of search terms forming a phrase;

rewriting the first search query, based on the phrase, into a modified search query; and

mapping the first search query to the modified search query in the memory; and

subsequently processing a second search query including:

receiving the second search query having second content;

determining whether at least one portion of the second content matches the first content; and

in response to the at least one portion of the second content matching the first content, issuing a search that includes the modified search query in place of the at least one portion of the second search query, to a backend data system to return one or more corresponding search results as responsive to the received second search query.

24. (Canceled)

25. (Previously Presented) The computer-readable storage device of claim 23, wherein the method further comprises:

issuing a search of the received second search query to the backend search system in response to the second content not comprising any portion that matches the first content.

26. (Previously Presented) The computer-readable storage device of claim 23, wherein mapping the first search query to the modified search query in the memory comprises generating a look-up table for the mapping.

27. (Previously Presented) The computer-readable storage device of claim 23, wherein the mapping is configured to run offline prior to the step of receiving the second search query; and the issuing the search is configured to run online upon receiving the second search query.

28. (Previously Presented) The computer-readable storage device of claim 23, wherein rewriting the first search query into the modified search query comprises:

determining that the first search query is frequently received;

issuing the first search query to the backend data system to find information related to the first search query;

determining additional content for the first search query based on the related information;

and

rewriting the first search query into the modified search query having the first content and the additional content.

29. (Previously Presented) The computer-readable storage device of claim 23, wherein rewriting the first search query into the modified search query comprises:

determining a more common or popular phrase or term for the first content of the first search query; and

rewriting the first search query into the modified search query having the more common or popular phrase or term in place of the first content.

30. (Previously Presented) The computer-readable storage device of claim 23, wherein rewriting the first search query into the modified search query comprises:

determining an additional phrase or term for the first content of the first search query; and augmenting the first search query with the additional phrase or term.

31. (Previously Presented) A method comprising:

populating a memory, wherein populating the memory comprises:

receiving at a search interface a plurality of instances of a first search query having a first plurality of search terms forming a phrase;

determining an indicator of frequency with which the first search query has been received at the search interface;

when the first search query is determined, based on the indicator of frequency, to be among a group of most frequently received queries relative to other queries received at the search interface that are different than the first search query, rewriting the first search query, based on the phrase, into a modified search query having a second plurality of search terms that are different in content or order than the first plurality of search terms, and mapping the first search query to the modified search query in the memory; and

subsequently processing a second search query including:

receiving the second search query;

determining that at least one portion of the second query matches one or more of the first plurality of search terms; and

executing a search of the modified search query in place of the at least one portion of the second search query, and returning one or more corresponding search results as responsive to the received second search query.

32. (Withdrawn) A computer-implemented method comprising:

receiving from a plurality of different users, at a search interface, a first search query having a first content;

rewriting the first search query into a modified search query;



executing a search of the first search query to produce a first set of results, and executing a search of the modified search query to produce a second set of results;

providing the first set of results to a first subset of the plurality of different users, providing the second set of results to a second subset of the plurality of different users that is different than the first subset, and tracking responses to the first set of results and the second set of results;

when tracked responses to the first set of results and second set of results indicate a user-preference for the second set of results, mapping the first search query to the modified search query in a memory;

receiving a second search query having a second content;

determining whether at least a portion of the second content matches the first content;

in response to a determination that the least one portion of the second content matches the first content, substituting the modified search query for the at least one portion of the second content to form a modified second search query; and

issuing a search of the modified second search query having the substituted modified search query to return one or more search results.

### REMARKS

Applicants have received the Office Action mailed December 3, 2008. Claims 1, 3-23, and 25-31 are pending, of which claims 1, 23 and 31 are independent. Applicants request reconsideration of the pending claims in view of the following remarks.

#### **Claim Rejections -35 U.S.C. § 102**

Claims 1, 3-20, 23, 25-29 and 31 were rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by U.S. Patent No. 6,144,958 ("Ortega").

Applicants submit that Ortega does not anticipate Applicants' claim 1, because the relied upon portions of Ortega do not disclose each element of claim 1, as required for anticipation. In particular, for example, the relied upon portions of Ortega do not disclose "subsequently processing a second query including: receiving the second search query having a second content; [and] determining whether at least one portion of the second content matches the first content." Such a feature can permit certain implementations to rewrite a query, and subsequently rewrite a matching query in a similar way when that matching query is received. In this manner, search quality can be improved because the subsequently-received queries can be processed quickly by performing the pre-determined query rewrite.

The Examiner pointed to column 5, lines 17-26 in Ortega as allegedly disclosing such features. However, that passage merely shows the making of a correlation between terms that frequently appear in search queries together:

In accordance with another aspect of the invention, the correlation table 50 preferably contains or reflects historical information about the frequencies with which specific search terms have appeared together within the same search query. As depicted in FIG. 1, this data is preferably extracted from the query log 36 using a table generation process 46. Incorporating such historical information into the spell correction process further increases the likelihood that a replacement term located by the process will be the term that was intended by the user.

Such discussion merely relates to comparing terms that appear together in a particular single query. It does not disclose making a comparison between content from a first search

query and then from a second search query—i.e., “determining whether at least one portion of the second content matches the first content,” in the words of pending claim 1.

More generally, Ortega is directed to a “System and Method for Correcting Spelling Errors in Search Queries.” Such spelling correction is performed by looking at intra-query correlations between words, i.e., by determining how frequently terms appear in a query together. Thus, when a user submits a query containing a word that is recognized and a word that is not recognized, the system can identify the recognized word in a log of previously-submitted queries, identify words that have appeared with the recognized word in prior queries, and then determine which of those words is most like the unrecognized word so as to make a spelling correction. *See* Ortega, column 1, line 60 – column 2, line 43. It is in that context that the block quote above refers to frequencies with which search terms “have appeared together within the same search query.” The Ortega reference simply saves the exact terms from prior queries, and does not rewrite those queries as recited in claim 1. Ortega thus does not rewrite a first query into a modified search, and in turn does not execute a later search using such a modified search query. Thus, Applicants respectfully submit that Ortega neither discloses nor fairly suggests the features of pending claim 1 and its dependent claims, and request that section 102 rejections of claim 1 and its dependent claims be withdrawn.

Independent claim 23 is directed to a computer-readable storage device, and includes the element “subsequently processing a second query including: receiving the second search query having a second content; determining whether at least one portion of the second content matches the first content.” For at least the reasons discussed in connection with claim 1, Applicants submit that claim 23 is patentable over the Ortega patent, and request that section the 102 rejections over Ortega of claim 23, and of corresponding dependent claims 25-29, be withdrawn.

Independent claim 31 is directed to a method, and includes the element “subsequently processing a second search query including: receiving the second search query; determining that at least one portion of the second query matches one or more of the first plurality of search terms,” which is substantially similar to the features of claim 1 discussed above. As such, for at

least the reasons discussed in connection with claim 1, Applicants submit that claim 31 is patentable over Ortega, and request that section 102 rejection be withdrawn.

### **Claim Rejections – 35 U.S.C. § 103**

Claim 21 was rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Ortega in view of the Examiner's Official notice. Claim 21 depends on claim 1, whose differences over Ortega are discussed above. For the reasons discussed above, Applicants submit that claim 21 is patentable, and request withdrawal of the rejection.

Claims 22 and 30 were rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Ortega in view of U.S. Patent No. 6,006,225 to Bowman. Claim 22 depends on claim 23, and claim 30 depends on claim 23. For the reasons discussed above, and because Bowman does not cure the failings of Ortega, Applicants request allowance of claims 22 and 30 also.

### **Conclusion**

Applicants submit that claims 1, 3-23, and 25-31 are in condition for allowance, and request that the Examiner issues a notice of allowance.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment

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No fee is believed due in connection with this submission. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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3/3/09

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